EXECUTIVE SUMMARY

SITE AND OPERATIONS OVERVIEW

The Portsmouth Gaseous Diffusion Plant (PORTS) is one of two uranium enrichment facilities operating in the United States (see Fig. 1). Responsibility for implementing environmental compliance at PORTS is split between the U.S. Department of Energy (DOE), as site owner, and the United States Enrichment Corporation (USEC), a corporation formed by the Energy Policy Act of 1992 to operate the nation's uranium enrichment business. The uranium enrichment production and operations facilities at the site are leased to USEC.

Bechtel Jacobs Company LLC assumed responsibility as the management contractor for DOE on April 1, 1998. Bechtel Jacobs Company is responsible for environmental restoration, waste management, uranium programs, and operation of nonleased facilities at PORTS. With the exception of Chap. 4, Environmental Monitoring, and Chap. 5, Dose, this report does not cover USEC operations at PORTS. USEC data is included in these two chapters to provide a more complete picture of the programs in place at PORTS to detect and assess potential impacts to human health and the environment resulting from PORTS activities.

Fig. 1. The Portsmouth Gaseous Diffusion Plant.

PORTS is located on 5.8 square miles in Pike County, Ohio. The county has approximately 24,250 residents.

ENVIRONMENTAL COMPLIANCE

Several federal, state, and local agencies are responsible for enforcing environmental regulations at PORTS. DOE/PORTS conducts a self-assessment program that addresses environmental concerns and involves regulatory agencies to verify appropriate actions are being taken to maintain compliance. DOE/PORTS has been issued a National Pollutant Discharge Elimination System (NPDES) permit for discharge of water to surface streams, several air emission permits, and a Resource Conservation and Recovery Act (RCRA) permit for storage of hazardous wastes.

Environmental compliance activities in 1999 included (1) continued management of RCRA hazardous waste in accordance with the facility's permit and applicable regulations, (2) continued management of PCBs in accordance with the Toxic Substances Control Act and the PORTS Federal Facilities Compliance Agreement, (3) preparation of the annual National Emissions Standards for Hazardous Air Pollutants report for radiological emissions, (4) receipt of a new air emission permit associated with remedial activities at the X-734 landfill, (5) ongoing monitoring of NPDES outfalls, (6) submittal of information for the hazardous chemical inventory required by the Emergency Planning and Community Right-to-Know Act, and (7) submittal of the Toxic Chemical Release inventory report.

None of the NPDES permit limits were exceeded during 1999. No violations of air permits or National Emission Standards for Hazardous Air Pollutants limits occurred in 1999 at DOE/PORTS. No unplanned releases of hazardous substances that required reporting under environmental regulations occurred in 1999.

In 1999, one Notice of Violation was issued to DOE by the Ohio Environmental Protection Agency (EPA). Ohio EPA issued a Notice of Violation regarding revisions to one of PORTS RCRA Corrective Action Program documents: the *Quadrant I Cleanup Alternatives Study/Corrective Measures Study*. This dispute was resolved in 2000 and Ohio EPA considers DOE to have returned to compliance concerning the issue that caused the Notice of Violation.

No Notices of Violation were issued to DOE/PORTS in 1999 resulting from inspections by regulatory agencies.

ENVIRONMENTAL PROGRAMS

Environmental Restoration, Waste Management, and Public Information Programs are conducted at PORTS to protect and inform the local population, improve the quality of the environment, and comply with federal and state regulations.

Environmental Restoration Program

Environmental restoration is the process of cleaning up inactive waste sites and facilities to demonstrate that risks to human health and the environment are either eliminated or reduced to safe levels. DOE established the Environmental Restoration Program to find, analyze, and correct site contamination problems as quickly and inexpensively as possible. This task may be accomplished by removing, stabilizing, or treating hazardous substances. Program expenditures in 1999 were $21 million.

The Ohio Consent Decree and the U.S. EPA Administrative Consent Order require investigation and cleanup of PORTS in accordance with the RCRA Corrective Action Program. The site is divided into four quadrants to facilitate the investigation and cleanup.

Following approval of the cleanup alternative study/corrective measures study for Quadrant III and the X-734 Landfill Area in Quadrant IV, the Ohio EPA issued decision documents to notify DOE/PORTS of the final remedial actions (corrective measures) chosen for these areas. Implementation of these final remedial actions began in 1999.

The *Quadrant I Cleanup Alternative Study/Corrective Measures Study* was submitted to Ohio EPA on May 28, 1999. Based on comments received from both the U.S. EPA and Ohio EPA, the *Quadrant I Cleanup Alternative Study/Corrective Measures Study* was revised and resubmitted to Ohio EPA on December 28, 1999. Development of the *Quadrant II Cleanup Alternative Study/Corrective Measures Study* continued in 1999.

Waste Management Program

The DOE/PORTS Waste Management Program directs the safe storage, treatment, and disposal of waste generated from plant operations and from environmental restoration projects.

Waste management activities must comply with DOE Orders, Ohio EPA regulations, and U.S. EPA regulations. Waste management requirements are varied and often complex because of the variety of wastes generated by DOE/PORTS activities. The types of waste managed by DOE/PORTS include:

- *Low-level radioactive waste (LLW)* – radioactive waste not classified as high level or transuranic and that does not contain any components regulated by RCRA or the Toxic Substances Control Act.

- *Hazardous (RCRA) waste* – waste that contains one or more of the wastes listed under RCRA or that exhibits one or more of the four RCRA hazardous characteristics: ignitability, corrosivity, reactivity, and toxicity.

- *RCRA/LLW mixed waste* – waste containing both hazardous and radioactive components. The waste is subject to RCRA, which governs the hazardous components, and to additional regulations that govern the radioactive components.

- *PCB wastes* – waste containing PCBs, a class of synthetic organic chemicals. Under Toxic Substances Control Act regulations, PCB manufacturing was prohibited after 1978. However, continued use of PCBs is allowed, provided that the use does not pose a risk to human health or the environment. Disposal of all PCB materials is regulated under the Toxic Substances Control Act.

- *PCB/LLW mixed waste* – waste containing both PCB and radioactive components. The waste is subject to the Toxic Substances Control Act that governs PCB components, and to additional regulations that govern radioactive components.

- *Industrial sanitary waste* – waste generated by commercial operations, such as office waste.

Supplemental policies also have been implemented for waste management including minimizing waste generation; characterizing and certifying wastes before they are stored, processed, treated, or disposed; pursuing volume reduction (such as blending and bulking) as well as on-site storage in preparation for safe and compliant final treatment and/or disposal; and recycling.

Public Awareness Program

DOE provides a public Environmental Information Center to allow access to all documents used to make decisions on remedial actions being taken at PORTS. The information center is located on the plant-site just outside the E-Vehicle portal and is open 9 a.m. to 12 p.m. Monday and Tuesday, 12 p.m. to 4 p.m. Wednesday and Thursday, or by appointment (740-289-3317). Additional information is provided by the DOE Site Office (740-897-2001) and the Bechtel Jacobs Company Public Affairs Manager (740-897-2336).

Semiannual public update meetings and public workshops on specific topics are held to keep the public informed and to receive their comments and questions. Fact sheets about major projects are produced periodically for the public, and semiannual environmental bulletins are printed and distributed to more than 4,000 recipients, including those on the community relations mailing list, neighbors residing within 2 miles of PORTS, and all plant employees and retirees.

ENVIRONMENTAL MONITORING

Environmental monitoring at PORTS includes air, water, soil, and biota (animals, vegetation, and crops) and includes measurement of both radiological and chemical parameters. Environmental monitoring programs may be required by regulations, permit requirements, and DOE Orders, but also may be developed to reduce public concerns about plant operations. In 1999, environmental monitoring information was collected by both DOE and USEC for the following programs:

- Airborne discharges,
- Ambient air,
- Direct radiation,
- Discharges to surface water,
- Surface water,
- Sediment,
- Soil,
- Vegetation, and
- Biota.

Evaluation of 1999 environmental monitoring data indicates that PORTS activities in 1999 had a minimal environmental impact, if any, inside or outside facility boundaries.

DOSE

Potential impacts on human health from radionuclides released by PORTS operations are calculated based on environmental monitoring data. This impact, called a dose, can be caused by radionuclides released to air and/or water, or radiation emanating directly from buildings or other objects at PORTS. The U.S. EPA sets a 10 millirem (mrem)/year limit for dose from radionuclides released to the air and the DOE sets a 100 mrem/year limit for dose from radionuclides from all potential pathways (air, water, and direct radiation). A person living in southern Ohio receives a dose of approximately 300 mrem/year from natural sources of radiation (National Council on Radiation Protection 1987) Fig. 2 provides a comparison of the doses from various common radiation sources.

This report includes radiological dose calculations for the dose to the public from radionuclides released to the air and surface water, and from direct radiation based on environmental monitoring data

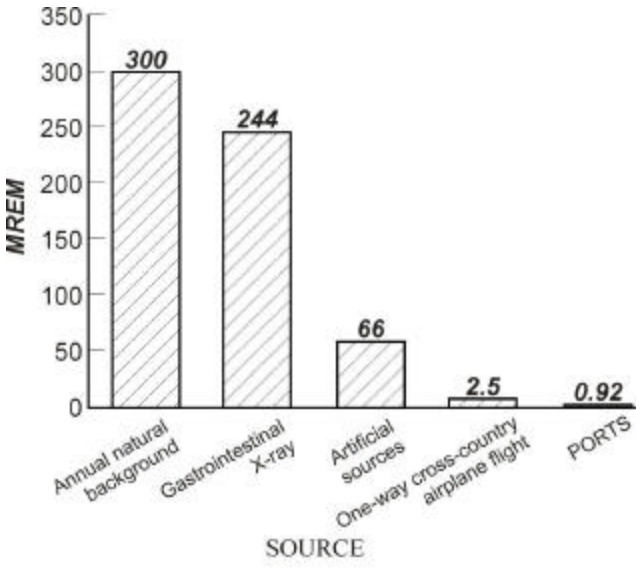

Fig. 2. Comparison of dose from various common radiation sources.

collected by both DOE and USEC. The maximum dose a member of the public could receive from radiation released by PORTS in 1999 is 0.92 mrem, based on a maximum dose of 0.28 mrem from airborne radionuclides, 0.053 mrem from radionuclides released to the Scioto River, and 0.59 mrem from direct radiation from the PORTS depleted uranium cylinder storage yards.

GROUNDWATER PROGRAMS

Groundwater monitoring at DOE/PORTS includes RCRA hazardous waste units, solid waste disposal units, and RCRA Corrective Action Program units. In 1999, the *Integrated Groundwater Monitoring Plan* became the implementing document for groundwater monitoring at PORTS. The *Integrated Groundwater Monitoring Plan* was designed to minimize the potential for confusion interpreting requirements and to maximize resources for collecting the data. The plan establishes all groundwater monitoring requirements for PORTS and has been reviewed and approved by Ohio EPA.

Additional groundwater monitoring is completed to meet DOE Order requirements. Exit pathway monitoring assesses the effect of DOE/PORTS on regional groundwater quality and quantity. Baseline monitoring is conducted to establish background data for use in assessing the effect of DOE/PORTS operations on the groundwater. DOE Orders are also the basis for the radiological monitoring of groundwater at PORTS.

Five groundwater contamination plumes have been identified onsite at PORTS. The primary groundwater contaminant is trichloroethene. Remediation of groundwater is being addressed under Ohio EPA's RCRA Corrective Action Program. No significant changes in the groundwater plumes were noted in 1999.

The *Integrated Groundwater Monitoring Plan* also addresses monitoring of residential water supplies near PORTS to verify that site contaminants have not migrated off site. Results of this program indicate that PORTS has not affected drinking water outside the site boundaries.

QUALITY ASSURANCE AND QUALITY CONTROL

Data reliability is of the utmost importance for monitoring releases and measuring radiation in the environment. To demonstrate that the monitoring and measurement results are accurate, DOE/PORTS has implemented a quality assurance and quality control program based on guidelines from the U.S. EPA, the American Society for Testing and Materials, and other federal and state agencies. The DOE/PORTS staff administers numerous quality control activities to verify reliability of the data on a day-to-day basis.

DOE/PORTS also participates actively in quality control programs administered by agencies outside the site such as the U.S. EPA.